UNITED STATES PATENT AND TRADEMARK OFFICE

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/698,055	HEBSGAARD ET AL.
	Examiner	Art Unit	
	Jianye Wu	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>6/2/08</u>.

2a)☒ This action is **FINAL**.　　　　2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
　　closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-6,8-11,13-17,19-22 and 24-26</u> is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-6,8-11,13-17,19-22 and 24-26</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☐ All　b)☐ Some * c)☐ None of:

　　　　1.☐ Certified copies of the priority documents have been received.

　　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
　　　　　　application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
　　Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
　　Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1.   A request for continued examination under 37 CFR 1.114, including the fee set

forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this

application is eligible for continued examination under 37 CFR 1.114, and the fee set

forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action

has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on

12/22/08 has been entered.

Response to Amendments/Arguments

2.   Applicant's arguments regarding 35 USC 103 rejection have been considered but

are moot in view of the new ground(s) of rejection due to the fact that all independent

claims have been amended to which new ground rejections are made.

Claim Objections

3.   Claims 3-4 are objected because they depend from the claim 2 which has been

cancelled. For examination on the merits, the claims will be interpreted as the best

understood.

Claim Rejections - 35 USC § 112

4.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of
> making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the
> art to which it pertains, or with which it is most nearly connected, to make and use the same and shall
> set forth the best mode contemplated by the inventor of carrying out his invention.

5.   **Claims 13-17** and **19-22** are rejected under 35 U.S.C. 112, first paragraph, as

failing to comply with the written description requirement. The claim(s) contains subject

matter which was not described in the specification in such a way as to reasonably

convey to one skilled in the relevant art that the inventor(s), at the time the application

was filed, had possession of the claimed invention.

Claim 13 recites a new limitation "stores out of sequence MAC layer in a second

buffer", it is not in the specification originally filed.

Claims 14-17 and 19-22 are rejected because they depend from claim 13.

For examination on the merits, the claims will be interpreted as the

best understood.

All dependent claims are rejected because they depend from independent

claims.

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

> 1. Determining the scope and contents of the prior art.
> 2. Ascertaining the differences between the prior art and the claims at issue.
> 3. Resolving the level of ordinary skill in the pertinent art.
> 4. Considering objective evidence present in the application indicating obviousness or
> nonobviousness.
> .

1.   **Claims 1, 3-6, 8-11,13-17,19-22** and **24-26** are rejected under 35 U.S.C. 103(a)

as being unpatentable over Radhakrishnan et al. (US Patent Number 7,000,021 B1,

hereinafter **Radhakrishnan**) in view of Rauschmayer (US 20030128681 A1), further in

views of .

For **claim 1** and **24**, Radhakrishnan discloses a method and a fixed wireless

device for transmitting and receiving wireless communication signals (*a point to*

multipoint wireless communication system, lines 10-11 of Col. 1), comprising:

forming MAC layer signals according to a DOCSIS protocol ("DOCSIS packets

are transmitted", lines 48-49 of Col. 4);

adding, at the MAC layer, an ARQ (*ARQ in its MAC layer*, line 59 of Col. 1)

header containing a sequence number to each of the MAC layer signals ("with an ARQ

header that includes a sequence number", lines 48-50 of Col. 4; or 1308 of FIG. 13);

transmitting a first group of MAC layer signals within packet data units (PDUs)

from a wireless radio transceiver ("DOCSIS packets are transmitted", lines 48-49 of Col.

4 or line 17 of Col. 2, 506 of FIG. 5);

storing the transmitted MAC layer signals in a transmitter window formed in

memory ("*Store packet in buffer*", 506 of FIG. 5; or lines 52-54 of Col. 4);

receiving a first negative-acknowledge signal (602 of FIG. 6 "Read sequence

number of first packet number not received"; or "ARQ operation … begins at… the first

unacknowledged packet", col. 6, line 48-51);

if a specified period has elapsed since receiving the first negative-acknowledge

signal (702 of FIG. 7, "Expiration of request acknowledgement timer" and col. 8, line 5-

7), requesting an explicit acknowledgment from the receiver (710 of FIG. 7, "send

request for acknowledgment") or deleting a first group MAC layer signals stored within

the transmission window that were transmitted prior to the identified missing PDU in the

negative-acknowledge (714 of FIG. 7, "flush all outstanding packets");

receiving a second group of MAC layer signals stored within the transmission

window ("next missing sequence number", col. 7, line 50-52) that were transmitted prior

to the identified missing PDU in the negative-acknowledge (602 of FIG. 6, when value of

"retry limit" is not 0 in view of col. 7, line 55-64);

deleting second group of MAC layer signals stored within the transmission

windows that were transmitted prior to the identified missing PDU in the negative-

acknowledge (618 of FIG. 6 or "the packets are flushed from the location of" first NACK

"until the location of the next missing sequence number", col. 7, line 55-64);

buffering out of sequence MAC layer signals until in sequence delivery occurs

(buffer 402 of FIG. 4 stores out of sequence packets, col. 6, line 42-51);

deleting stored MAC layer signals if sequence number identified in the negative-

acknowledge signal does not correspond to a sequence number for a stored MAC layer

signal (904 "Is sequence number valid?" and 916 "flush packets in window" of FIG. 9);

Radhakrishnan is silent on the timer is started after receiving a negative

acknowledge signal.

In the same field of endeavor, Rauschmayer teaches the acknowledge signal is a

negative acknowledge signal with missing sequence number ("'Negative

Acknowledgment' ('NAK') message. The NAK message includes the missing Sequence
Number(s)", [0025]).

Therefore, it would have been obvious to a person of ordinary skill in the art at
the time of the invention to modify Radhakrishnan with Rauschmayer to use a negative-
acknowledge signal to reduce the number of acknowledge signal while ensuring all data
being received properly.

For **claim 13**, Radhakrishnan discloses a wireless **transceiver** for transmitting
and receiving wireless communication signals (*a point to multipoint wireless
communication system*, lines 10-11 of Col. 1), comprising:

a receiver portion (receiver, line 51 of Col. 4) that receives negative-acknowledge
signals (602 of FIG. 6 "Read sequence number of first packet number not received"; or
"ARQ operation … begins at… the first **unacknowledged** packet", col. 6, line 48-51)
transmitted by a remote device over a wireless medium ("a typical wireless point to
multipoint network", lines 18-19, Col. 2); and

wherein the wireless transceiver:

forms MAC layer signals according to a DOCSIS protocol ("DOCSIS packets are
transmitted", lines 48-49 of Col. 4);

adds, at the MAC layer, an ARQ (*ARQ in its MAC layer*, line 59 of Col. 1) header
containing a sequence number to each of the MAC layer signals ("with an ARQ header
that includes a sequence number", lines 48-50 of Col. 4; or 1308 of FIG. 13);

transmits the MAC layer signals ("DOCSIS packets are transmitted", lines 48-49
of Col. 4 or line 17 of Col. 2, 506 of FIG. 5);

stores the MAC layer signals in a first buffer of a memory (*"Store packet in buffer"*, 506 of FIG. 5; or lines 52-54 of Col. 4);

receives a first negative-acknowledge signal (the first unacknowledged packet", col. 6, line 48-51) and if a specified period has elapsed since receiving the first negative-acknowledge signal (702 of FIG. 7, "Expiration of request acknowledgement timer" and col. 8, line 5-7), or since the MAC layer signals were transmitted without receiving the first negative-acknowledge signal, Requests an explicit acknowledgement from the remote device or deletes a group of stored MAC layer signals (714 of FIG. 7, "flush all outstanding packets");

receives a second negative-acknowledge (the next missing sequence number", col. 7, line 55-64) that identifies a missing packet data unit (PDU) (602 of FIG. 6, "Read sequence number of first packet number not received") and deleting a group of packet data units transmitted prior to the identified missing PDU (622 of FIG. 6, "Flush packets that have exceeded retry limit");

stores out of sequence MAC layer signals in a second buffer ("a receiver retransmission buffer" 802 of FIG. 8);

deletes stored MAC layer signals if sequence number identified in the negative-acknowledge signal does not correspond to a sequence number for a stored MAC layer signal (904 "Is sequence number valid?" and 916 "flush packets in window" of FIG. 9);

maintains three timers (3 timers: Ta, Tf and Tr, col. 6, lines 26-28) to track a maximum time a transmitter has to store a packet for retransmission (Maximum request timer Ta, col. 6, line 27), a flush time (frame flush timer Tf, col. 6, line 28) and a time a

receiver must allow between each negative-acknowledge signal (timer Tr, col. 6, line 26); and

maintains two counters to track a maximum number of retries for transmitting a packet ("Maximum number of retries for transmitting a packet" Rr, col. 6, line 29) and to track a maximum number of retries for the explicit acknowledge message (maximum number of retries for the explicit acknowledge message Rt, col. 6, line 30).

Radhakrishnan is silent on the timer is started after receiving a negative acknowledge signal.

In the same field of endeavor, Rauschmayer teaches the acknowledge signal is a negative acknowledge signal with missing sequence number ("'Negative Acknowledgment' ('NAK') message. The NAK message includes the missing Sequence Number(s)", [0025]).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Radhakrishnan with Rauschmayer to use a negative-acknowledge signal to reduce the number of acknowledge signal while ensuring all data being received properly.

As to **claim 3**, Radhakrishnan and Rauschmayer disclose the method of claim 1 further including storing transmitted PDUs until the second negative acknowledge signal is received (lines 62-67, Col. 4 and FIG. 6).

As to **claim 4**, Radhakrishnan and Rauschmayer disclose the method of claim 1 further including receiving the second negative acknowledge from a receiver, the the

second negative acknowledge including a previously transmitted sequence number
(lines 52-54, Col. 4; or FIG. 6).

As to **claim 5**, Radhakrishnan and Rauschmayer disclose the method of claim 4
further including deleting a group of stored MAC layer signals, the group of stored MAC
layer based the previously transmitted sequence number (lines 52-54 of Col. 4; or 606
of FIG. 6).

As to **claim 6**, Radhakrishnan and Rauschmayer disclose the method of claim 5
wherein the group comprises all MAC layer signals transmitted prior to the MAC layer
signal containing the previously transmitted sequence number (lines 54-60, Col. 4).

As to **claim 8**, Radhakrishnan and Rauschmayer disclose the method of claim 4
further including retrieving a stored MAC layer signal that corresponds with the
previously transmitted sequence number received in the second negative acknowledge
(lines 60-61, Col. 4; or 902 of FIG. 9).

As to **claim 9**, Radhakrishnan and Rauschmayer disclose the method of claim 8
further including transmitting the stored MAC layer signal that corresponds with the
previously transmitted sequence number received in the second negative acknowledge
(lines 60-61, Col. 4; or 618 of FIG. 6).

As to **claim 10**, Radhakrishnan and Rauschmayer disclose the method of claim 9
further comprising deleting all stored MAC layer signals that were transmitted prior to
the stored MAC layer signal that corresponds with the previously transmitted sequence
number received in the acknowledge (606 of FIG. 6; or lines 52-54, Col. 4).

As to **claim 11**, Radhakrishnan and Rauschmayer disclose the method of claim 4 further including determining (*confirms*, line 56, Col. 4) whether the previously transmitted sequence number identified in the second negative acknowledge corresponds to a sequence number for one of the stored MAC layer (lines 56-61, Col. 4).

As to **claim 14**, Radhakrishnan and Rauschmayer disclose the wireless transceiver of claim 13 wherein the wireless transceiver stores transmitted frames until first or second negative-acknowledge signal (*missing packet*, line 64 of Col. 4; or 602 of FIG. 6 "Read sequence number of first packet number not received"; or "ARQ operation … begins at… the first **unacknowledged** packet", col. 6, line 48-51) are received (Col. 4, lines 62-67).

As to **claim 15**, Radhakrishnan and Rauschmayer disclose the wireless transceiver of claim 13 wherein the wireless transceiver receives and responds to the first or second negative-acknowledge signal from a receiver (602 of FIG. 6 "Read sequence number of first packet number not received"; or "ARQ operation … begins at… the first **unacknowledged** packet", col. 6, line 48-51), the negative-acknowledge signal including a previously transmitted sequence number (FIG. 6; or lines 56-61 of Col. 4).

As to **claim 16**, Radhakrishnan and Rauschmayer disclose the wireless transceiver of claim 15 wherein the wireless transceiver deletes a group of stored MAC layer signals, the group of stored MAC layer signals being a function of a value of the previously transmitted sequence number (lines 52-54 of Col. 4).

As to **claim 17**, Radhakrishnan and Rauschmayer disclose the wireless transceiver of claim 16 wherein the group comprises all MAC layer signals transmitted prior to the MAC layer signal containing the previously transmitted sequence number (lines 52-54 of Col. 4).

As to **claim 19**, Radhakrishnan and Rauschmayer disclose the wireless transceiver of claim 16 wherein the wireless transceiver retrieves a stored MAC layer signal that corresponds with the previously transmitted sequence number received in the acknowledge signal (lines 52-54 of Col. 4).

As to **claim 20**, Radhakrishnan and Rauschmayer disclose the wireless transceiver of claim 19 wherein the wireless transceiver transmits the stored MAC layer signal that corresponds with the previously transmitted sequence number received in the acknowledge signal (lines 56-61 of Col. 4).

As to **claim 21**, Radhakrishnan and Rauschmayer disclose the wireless transceiver of claim 20 wherein the wireless transceiver deletes (flushes) all stored MAC layer signals that were transmitted prior to the stored MAC layer signal that corresponds with the previously transmitted sequence number received in the acknowledge signal (606 of FIG. 6; or lines 52-54, Col. 4).

As to **claim 22**, Radhakrishnan and Rauschmayer disclose the wireless transceiver of claim 16 wherein the wireless transceiver determines whether the previously transmitted sequence number identified in the acknowledge signal is corresponds to a sequence number for a stored MAC layer signal (lines 52-54 of Col. 4).

As to **claim 25**, Radhakrishnan and Rauschmayer disclose the fixed wireless device of claim 24 wherein the means for communicating includes a receiver portion that receives non-acknowledge signals transmitted by another device over a wireless medium and a transmitter portion, wherein the transmitter portion:

forms MAC layer signals according to a DOCSIS protocol (line 64 of Col. 1);

adds, at the MAC layer, an ARQ header containing a sequence number (FIG. 13) to each of the MAC layer signals;

transmits the MAC layer signals (line 17 of Col. 2; or 506 of FIG. 5);

stores the MAC layer signals (lines 52-54 of Col. 4); and

deletes at least one stored MAC layer signal after receiving the negative acknowledge (606 of FIG. 7; or lines 52-54, Col. 4).

As to **claim 26**, Radhakrishnan and Rauschmayer disclose the fixed wireless device of claim 25 wherein the fixed wireless device stores transmitted frames until either a non-acknowledge signal is received or the timer expires (FIG. 7; or lines 56-58, Col. 4).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jianye Wu whose telephone number is (571)270-1665. The examiner can normally be reached on Monday to Thursday, 8am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on (571)272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jianye Wu/

Examiner, Art Unit 2416

/Kevin C. Harper/

Primary Examiner, Art Unit 2416